7. PUBLISHED STATE LESSONS LEARNED, TIPS, AND PITFALLS

Experience is the hardest kind of teacher.
It gives you the test first and the lesson afterwards.

So begins Rechtin's compendium [37] of 180 "heuristics" he elegantly generalized from the system architecting experiences of numerous colleagues. Similarly, enough time has gone by for well-documented lessons learned to be published specific to Intelligent Transportation Systems (ITS) and CVISN. The lessons learned extracted below are from the report *Early Institutional Lessons from the CVISN Model Deployments* [7]; they were gathered from visits and structured interviews in California, Oregon, Washington, Kentucky, and Connecticut.

7.1 Address High-Level Policy, Organizational Structure, Laws and Regulations

- **Support high-level policies encouraging interagency cooperation, information technologies, and automation, and link the CVISN project to those policies.** The greater the commitment toward automation at the level of state elected and appointed officials, the fewer hurdles will need to be overcome in obtaining buy-in for CVISN, the greater the support will be during implementation, and the greater synergy can occur across departments and organizational units.
- **Separate commercial vehicle programs from related programs, then procedures addressing commercial vehicles could be precisely tailored resulting in better service.** Several of the states have recently moved registration of commercial vehicles out of the group that deals with passenger car registrations and into its own program unit.
- **Consolidate as many commercial vehicle functions into one organization as possible.** When a project can be done entirely within one organization, fewer interests need to be considered before consensus is reached. For example, Kentucky moved IRP and IFTA transactions to the same department in order to improve efficiency. Such effort has associated costs that may be warranted if existing organizational structures impede progress toward policy goals, such as improved customer service and efficiency.
- **Align the organization with statewide policy priorities.** For instance, Kentucky's move to consolidate IRP and IFTA functions in the same organization came from a statewide effort to automate processes and eliminate internal barriers to increase production and efficiency.
- **Review state laws and regulations for potential barriers, especially issues related to electronic transactions and protection of sensitive private company data.** State laws and regulations related to electronic transactions seem to create the most issues that need to be addressed. Several states noted that there are requirements for signatures on applications, and laws would need to be changed in order to accept electronic signatures. There may also be some difficulties in accepting electronic funds transfer without new legislation.

7.2 Cooperate To Take Advantage of Relative Strengths of All Partners and Interested Parties

- **Identify all interested parties and arrange working arrangements to accommodate the appropriate level of involvement for each party.** Washington has three agencies involved in the project; California has four; and Connecticut has six, although three primarily do the routine work. Connecticut has drawn in some of the agencies with peripheral interests that the other states are simply keeping informed.
- **Recognize the organization of a multi-agency (or multi-state) project and emphasize its strengths.** Including multiple agencies increases cross-pollination with other programs and the potential for a greater variety of contacts outside of the agency. In addition, it protects against loss of expertise by providing redundancy of knowledge when there is staff turnover. When multiple states are involved in CVISN, there are also state policies, procedures, and laws that are different. This can work in the project's favor by allowing activities to occur in the state where it is easiest and fastest. For instance, Washington took the lead in the Washington-Oregon pilot because Oregon's legislature would not be meeting soon enough for their approval to apply for federal funds to occur before the application deadline. Besides helping with procedural issues, the states can bring complementary expertise. Washington has experience with using laptop computers in enforcement, while Oregon has been involved in electronic clearance through operational tests such as the ITS/CVO Greenlight Project.
- **Take advantage of expertise, testing, and feedback available through cooperation with interested parties.**

Other state agencies or programs might be concerned about inspection of trucks for agricultural pests, or the possibility of electronic transactions with automobiles.

Local universities can play an important role. In Washington, the longstanding cooperation between the University of Washington and WSDOT was one factor leading to the use of advanced technologies to address congestion in the Seattle area. In Kentucky, the University of Kentucky Transportation Center plays an active role in the pilot. Prior to 1981, the transportation agency contained a Division of Research, which was renamed the Transportation Center and became part of the University's Department of Civil Engineering. The Center provides all transportation-related technical and project management support, as well as assistance with outreach and information dissemination functions.

National and regional organizations can address common issues. For example, the Western Association of State Highway and Transportation Officials (WASHTO) has helped resolve concerns related to roadside electronic clearance.

States cooperating in a region can benefit by saving resources through developing software once, rather than multiple times, and by resolving issues to make borders more transparent to commercial vehicles. Both Washington and Oregon were planning to use a new Over Size / Over Weight (OS/OW) system being developed by Utah.

State motor carrier associations can be valuable sources of political support, as well as insight into the needs of their members and resources for marketing new CVISN services. Connecticut has established a position of Industry Project Manager, held by the president of the most powerful trucking association in the state. The Industry Project Manager has been asked to set aside one day per week for project activities and is responsible for representing the industry's priorities at Council meetings and getting buy-in from carriers.

Individual carriers are needed to test the new procedures and systems before they go into widespread use. They benefit by obtaining access to the new services sooner. The public sector partners in Washington and Oregon are extending their relationship with industry to work with shipping lines to install transponders on shipments to allow tracking and U.S. Customs preclearance.

7.3 Recognize The Need For Proper Communications

- **At the start of the project, list all necessary communications and develop a strategy to ensure that they are carried out.** In states with multiple agencies involved, it can be easy to overlook a group unless responsibility for communications is assigned to an individual who is given the time to keep track of what is being done. In Washington State, attention was focused initially on management. Later, management realized that program staff were not receiving enough information to answer questions they were receiving from truckers and companies, and more emphasis was given to keeping program staff informed.
- **Allow additional time to obtain buy-in and consider assigning an individual to coordinate all "communications" or "marketing" if multiple agencies are involved.** In California, the larger number of actors resulting from the size of the government and consequent multiple agencies involved, and the resulting additional layers of approval needed, complicated and lengthened the task of gaining buy-in. In Connecticut, an early retirement program led to major loss of staff and changes in assignment of the remaining staff. As a result, a new effort to inform and educate management was required. The Management Coordinator, a staff person assigned to keep all project participants informed, played a major role in maintaining program continuity and buy-in during the major staff changes.
- **Maintain support for the project by reporting progress frequently to upper management and elected officials.**

- **Maintain regular communication with customer service staff**. Current staff can provide valuable input during the development of CVISN. CVISN is likely to change some current jobs. Communicating with staff about those changes can help allay fears about those changes or the potential for reductions in staff. In Washington, the Department of Licensing (DOL) marketed CVISN to staff by explaining the efficiencies that result. Consequently, the biggest hurdle in gaining staff buy-in was overcoming the perception that electronic data flow will result in a loss of jobs.
- **Keep industry associations "in the loop"** and take advantage of their contacts and business experience to market CVISN to motor carriers. Washington and Oregon are using the company SAIC, Inc. to be its Transponder Administrator, with Northwest Transporter, a regional trucking association, subcontracted to market transponders to motor carriers in those states. The project selected this team including Northwest Transporter in part because they believed this team understood their membership and would be best able to market the new service to it.

7.4 Plan Training For Both State CVO Staff And Motor Carrier Employees

- **Commercial drivers** need to understand when it is permitted to bypass a weigh station under electronic screening and clearance.
- **Motor carriers** beginning to apply for credentials electronically, or use transponders for electronic screening for the first time, need training on procedures.
- **For state staff, training in electronic credentialing, tax collection, and electronic funds transfer** will be needed when these new processes and technologies are involved. This training will need to be ongoing as information on updates to software becomes available.
- **For state staff, training will be needed on a range of associated topics, such as changes in state laws, regulations, policies, and procedures.** Training on policies related to release of data may become more important as more staff have access to more information.

7.5 Manage the Expectations of All Partners

- **It is important that all partners are aware of both the benefits and limitations of CVISN.** For instance, it should be made clear that roadside electronic screening can substantially reduce, but not eliminate, the number of times that a truck will be stopped.
- **The concerns of law enforcement** about inspecting trucks need to be balanced with the interests of motor carriers in getting the greatest benefit of participating in an e-screening program.

7.6 Lessons Learned from Lessons Learned – Nine Successful Approaches to Deploying a Metropolitan Intelligent Transportation System

One of the macro lessons learned from the published knowledge base (see References) is that ITS projects in every functional area face the same problems and wrestle with the same issues. This is not surprising when you consider all that they have in common:

- They are information systems with complex interacting software entities – some legacy, some COTS, and some newly developed.
- They rely on diverse and distributed databases, servers, and networks.
- They operate upon real-time information from a variety of sensors and input devices.
- They report information not only to an array of real-time displays but also to other independent software entities.

For this reason CVISN projects can look to other ITS projects for ideas, inspiration, and encouragement. The excellent ***Successful Approaches to Deploying a Metropolitan Intelligent Transportation System*** [33] is one such source. The Executive Summary is a "must read". Staff from the John A. Volpe National Transportation Systems Center visited and interviewed four ITS Model Deployment Initiative sites: AZTech (Phoenix), iTravel (NY-NJ-CT), Smart Trek (Seattle), and TransGuide (San Antonio). Nine key "successful approaches" were identified; the full report devotes one chapter to each. It also includes handy "deployment aids" – appendices with actual contract language from which the reader is invited to cut-and-paste; and tables of question-checklists to apply each of the report's major lessons learned to new projects.

The nine successful approaches documented in the Volpe study are summarized below.

Approach #1 Develop a Regional Perspective

- Build on Existing Relationships
- Involve Non-traditional Players
- Develop a Shared Vision
- Augment Existing Systems

Approach #2 Make ITS Visible

- Reach Out to the General Public
- Gain Support from Policy Makers and Upper Management
- Involve Metropolitan Planning Organizations
- Encourage Staff Involvement

Approach #3. Understand the Nuances of Partnering

- Recognize that Participants Have Differing Objectives
- Realize it Takes Time to Develop Trusting Relationships
- Define Explicitly the Roles and Responsibilities of the Parties
- Provide Incentives for Participating

Approach #4. Plan for Long-term Operations and Management

- Maintain the Support of Participants
- Build Support of Field Staff, Users, and Operators
- Facilitate Private Sector Involvement

Approach #5. Develop a Regional Management Structure

- Assign Roles Based on the Strengths of the Participants
- Identify a Full-time Project Manager and Give the Manager Authority
- Dedicate Other Support as Required
- Develop an Appropriate Committee Structure

Approach #6. Facilitate ITS within Your Organization

- Consider Organizational Changes
- Assess Skills and Staffing Requirements
- Address Training Needs

Approach #7. Identify Appropriate Procurement Mechanisms

- Be Flexible in Selecting Lead Procurement Agencies
- Be Flexible in Determining Contracting Mechanisms
- Develop Flexibility within the Contract

Approach #8. Address Intellectual Property Rights Issues Early

- Develop a Clear Policy Early
- Understand the Possible Areas of Concern

Approach #9. Develop Written Policies

- Address Equipment Issues
- Delimit the Use and Distribution of Data
- Address Legal Concerns
- Define Roles and Responsibilities